Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **2014**

Project **SR-SF01-LT / K Area Spent Nuclear Fuel Project (Post-2006)**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

In 1992, the Secretary of Energy directed the Assistant Secretary for Environmental Restoration and Waste Management (EM) to develop an integrated, long-term Spent Nuclear Fuel (SNF) management program. In response, EM initiated the development of a DOE-owned SNF program to define and ensure resolution of all associated issues starting with the quantification of DOE SNF inventories and fuel storage facilities. The purpose of the DOE-owned SNF program is to integrate DOE's existing SNF activities into one program to better control and manage this material and to ensure that all issues associated with SNF are resolved in a safe and cost effective manner.

K-Area at the Savannah River Site (SRS) plays an important role in this program, including all programmatic and physical support efforts related to safe storage of SNF, DNFSB Recommendation 94-1 shipments of irradiated fuel to H-Canyon (basin deinventory), and stabilization required to maintain the area. K-Area also serves to store unirradiated highly enriched uranium (HEU), large amounts of tritiated heavy water (HW) consolidated from other facilities, and Plutonium (Pu) received from Rocky Flats.

Part of the SRS SNF mission is to safely maintain the facilities in which the SNF is stored while waiting for ultimate disposition. Irradiated SRS fuel assemblies (Mk 16/22) are stored in the K-Area disassembly basin following discharge from the reactors. The K-Area SNF Project controls the water chemistry where these fuel rods are stored and carries out all activities that apply to fuel handling, storage, and shipping to other facilities.

Assuming H-Canyon operates, Mk16/22 SNF in K-Basin will be transferred to H-Canyon for processing. Per the latest Phased Canyon Strategy (dated 2/4/99), K-Basin deinventory of 94-1 SNF is scheduled to be completed by the end of 2QFY01. If H-Canyon does not operate, Mk 16/22 will remain in K-Basin until the new Treatment and Storage Facility (TSF) is operational (see TSF PBS). Also, if H-Canyon does not operate, K-Basin will be utilized for expediting the SS/Zr-clad fuel deinventory from RBOF.

As K-Area is in large part radioactively contaminated, basic surveillance and maintenance activities must be performed to ensure the facility: 1) continues to pose acceptable risk to the environment, site workers, and the general public; 2) is maintained in accordance with the current Safety Analysis and Authorization Basis requirements; and 3) continues cost effective management, planning, and oversight. Surveillance includes monitoring or observing activities required to ensure equipment/systems operate in compliance with the Authorization Basis. Maintenance includes day-to-day activities to preserve facilities and equipment from failure or decline to ensure they can perform their design function. Corrective and preventive maintenance for electrical, mechanical, hydraulic, and monitoring equipment and systems includes that associated with habitability, life safety, fire protection, security, ventilation, and environmental protection.

Four shift operations will continue in K-Area until deinventory of nuclear material is completed. K Control Room will continue to be manned 24 hr/day until all SNF, Pu, HEU, and HW is deinventoried.

The unirradiated HEU currently stored in K-Assembly area will remain in K-Area until DOE determines its ultimate disposition per DOE/EIS - 0240-S, Disposition of Surplus Highly Enriched Uranium Final EIS. Additional storage capacity may be added to accommodate the consolidation of the HEU currently stored in other DOE locations. Several options for the disposal of the HEU are currently being evaluated. One option calls for

Project Description Narratives

complete transfer of HEU to H-Canyon for blend-down by the end of FY04.

Containerized Pu from Rocky Flats will be received and stored in K-Area to reduce S&M costs at Rocky Flats. Security upgrades, MC&A Instrumentation modifications and other plant upgrades will be completed as appropriate by 1QFY01 (phase I, 2QFY00/phase II, 1QFY01). Pu is scheduled to be received from Rocky Flats from 2QFY00 until 1QFY02. The Pu will then be managed for up to 10 years until final disposition facilities are available.

K-Area provides for the consolidated storage of heavy water and its associated surveillance and maintenance. This consolidation reduces site-operating expenses by allowing the shutdown of systems in remote areas (ventilation and heating) required only for heavy water storage.
SFSD Conduct of Operations Improvements necessary to achieve site safety standards may require alternative funding including some program sacrifices in FY00 and FY01 in order to pay for these items. These include Configuration Management, Linking Document, Increased Rad Con, and the Asset Information Management system (AIMS).

Project Status in FY 2006:

K-Reactor basins will be in a low cost surveillance mode in FY2006. Assuming H-Canyon operates, all 94-1 material will have been removed prior to FY06; however, HEU, Pu, and heavy water may remain depending upon DOE direction to disposition this material. The Central Control Room operation may be moved for K to L once Pu material is in the S&M mode.

Post-2006 Project Scope:

Pending disposition and deinventory of all nuclear material, the K-Area Project will be under control of PBS's (K Reactor Deactivation Project SR-FA-11 and Reactors Monitoring Project SR-FA-20) controlled by others.

Project End State

K-Area facilities associated with the SNF program will be deinventoried, stabilized, and deactivated to the extent necessary to meet the guidelines for a nuclear industrial zone.

Cost Baseline Comments:

The financial figures for the Path to Closure (PtC) were derived using the SRS FY99 Annual Operating Plan (AOP) as the beginning basis. Outyear budget (OYB) requirements were estimated by factoring Detailed Information Input Forms (DIIF's) and outyear program planning assumptions/schedules against this AOP baseline. The OYB process utilizes the program requirements contained in the DOE Strategic Execution Guidance (SEG) as the formulation basis of detailed program/operating assumptions and Program Planning Packages used to communicate scope of work requirements to other SRS divisions, e.g. Construction, Waste Management, Environment, Safety & Health, etc. Financial estimates are generated by the line and support organizations using the DIIF system. Estimates were escalated for anticipated inflation using a 3.6% factor for FY00and 01, and 2.7% for FY02 and beyond - per the guidance from the site.

The full cost of PBS work scope may change based on the authorized funding and priorities in any given year due to changes in site overhead

Project Description Narratives

assumptions. For planning and budgeting purposes, work scope costs were estimated using site overhead rates sized for clearance at a funding target of $1,222.5 million. For FY2001 (the budget year), the site overhead is applied and cleared at the funding target, while the work scope below the funding target (planning level) is incremental direct cost. For FY2002, the site overhead is applied and cleared over the total planning level of scope.

Safety & Health Hazards:

The K-Area facilities include six areas: the Disassembly Basin, Purification Area, Assembly Area, Moderator Storage areas, and the Process Room, including the Crane Wash Maintenance/Stack Rooms. The major hazards associated with K-Area result from continued storage of contaminated moderator, irradiated fissile materials, irradiated aluminum and stainless steel reactor components, unirradiated reactor fuel Special Nuclear Materials (SNM), and storage of entrained radionuclides throughout 105-K and within components and the storage of chemicals necessary for the continued operation of these activities. Beginning in 2QFY00, containerized Pu will be stored in the Process, Crane Wash, Crane Maintenance and Stack Rooms.

K-Area facilities are classified as Hazard Category 2 facilities. Hazard Category 2 facilities have the potential for significant on-site radiological or chemical consequences. The criteria for determining the radiological hazard categories are provided in DOE-STD-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Report, and the criteria for determining the chemical hazard categorization are provided in WSRC-MS-92-206.
Determination of the above hazards are described in WSRC-TR-95-0497, Rev. 0, "Basis For Interim Operation (BIO) For The K-Reactor Facility (U)," Section 6, "Approach For Hazard Identification/Categorization." Chemical inventory is controlled in accordance with RDP 14.1 "Chemical Management Program," and "Chemicals and Non-radioactive Hazardous Materials Control (U), DPSOL 105-1845-K."

Hazards present in K-Area will vary during the accelerated cleanup of the facility. Basin operations will continue in K-Area until deinventory of irradiated nuclear materials is completed by the second quarter of FY01. Pu storage operations will continue untl final disposition facilities are available, currently scheduled no later than FY10. Surveillance and maintenance activities will continue through the deinventory/demobilization stage, at which point FDD will assume custodianship of the facility. The demobilization plan will contain provisions for ensuring adequate surveillance and maintenance is preformed during transition phase. Surveillance and maintenance requirements addressed are: radiation protection, hazardous chemical safety, physical safety and security, and potential public and environmental hazards.

Safety & Health Work Performance:

As described in DOE`s, "Safety Management System Policy," P450.4, there are six primary components that must be implemented: Objective, Principles, Functions, Implementation, Responsibilities, and Mechanisms. In adopting these components into the WSRC program, WSRC developed the Safety Management System Policy MP1.22, "Integrated Standards Based Safety Management Program," and submitted to the DOE (WSRC letter ESH-97-0004, F. B. Davis to L. C. Sjostrom, "Schedules for Implementation of a Safety Management System (SMS) (U)," dated March 17, 1997) WSRC-IM-97-10, Rev.0, "Safety Management System Description (U)." These documents describe the Safety Management System used to ensure safety is integrated into work performed under WSRC`s Contract No. DE-AC09-96SR1850.

The Department of Energy has determined (Authorization Agreement for K-Reactor Facility, 5480.23.16-K-Area-AA, Revision 0) through a series of comprehensive reviews, that K-Reactor Facility will be operated in compliance with the Standards/Requirements Identification Document (S/RID).

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Savannah River**

Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site**

HQ ID: **2014**

Project **SR-SF01-LT / K Area Spent Nuclear Fuel Project (Post-2006)**

Project Description Narratives

The Basis for Interim Operation (BIO) for the K-Reactor Assembly Area (WSRC-TR-93-500, Revision 3, as amended), the BIO for the K-Reactor in Cold Standby (WSRC-94-207, Revision 0, as amended), and the BIO for the K-Reactor Moderator Storage Areas (WSRC-TR-93-611, Revision 1, as amended) document the analysis of the facility hazards, specifies the controls necessary to prevent and mitigate the hazards, and defines a safety management program which affords an acceptable level of safety to the public, the workers, and the environment.

Through the performance of a Readiness Assessment and continuing operational assessments, there is reasonable assurance the facility can be operated without endangering the health and safety of the public, the workers, or the environment.

Activities and checkpoints are described by the Integrated Management System Description. The conditions and requirements are clearly established and agreed upon prior to the starting of any project and those requirements are contractually binding upon WSRC. The key elements of the WSRC Integrated Safety Program are to define the scope of work, identify and analyze hazards associated with the work, develop and implement hazard controls, perform work within controls, provide feedback on adequacy of controls and continue to improve safety management. The WSRC Integrated Procedures Management System is the primary mechanism for implementing the objective, principles and functions of the Safety Management System. This system establishes Company-Level, Division-level, and Program-specific procedures consistent with organizational roles, and ensures a consistent, discipline site-wide approach to safety while performing work.

PBS Comments:

The scope of this project includes all programmatic and physical support efforts related to safe storage of SNF, followed by 94-1 shipments of irradiated fuel to the canyon(s) (basin deinventory) and facility demobilization required to place K-Reactor in a safe, low-cost surveillance and maintenance mode. The eventual deactivation and end-state determination will be in SR-FA-11, K Reactor Deactivation Project.

Baseline Validation Narrative:

Independent validation efforts were done at SFSD in Fiscal Year 1998. These efforts were completed by an organization external to SFSD in a focused manner. The validation included a representative sample of programmatic operations, maintenance activities, and crosscutting overhead and service activities. As a result of this validation effort, the SFSD received the "validated" concurrence from the team.

General PBS Information

Project Validated?	Yes	**Date Validated:**	10/30/1998
Has Headquarters reviewed and approved project?	No		
Date Project was Added:			
Baseline Submission Date:	7/3/1999		
FEDPLAN Project?	Yes		

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **2014**

Project **SR-SF01-LT / K Area Spent Nuclear Fuel Project (Post-2006)**

General PBS Information

Drivers:	CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	N	N	Y	N	N	Y	Y	Y

Project Identification Information

DOE Project Manager: Sandra L. Johnson

DOE Project Manager Phone Number: 803-557-3828

DOE Project Manager Fax Number: 803-557-3996

DOE Project Manager e-mail address: sandra-l.johnson@srs.gov

Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	352,373	252,394	604,767	34,123	34,123	30,512	30,512	28,672	33,410	35,169	37,287	38,475	39,289	37,202	38,234
PBS Baseline (constant 1999 dollars)	322,269	183,975	506,244	34,123	34,123	30,512	30,512	28,672	32,249	32,767	33,827	33,987	33,794	31,158	31,180
PBS EM Baseline (current year dollars)	352,373	252,394	604,767	34,123	34,123	30,512	30,512	28,672	33,410	35,169	37,287	38,475	39,289	37,202	38,234
PBS EM Baseline (constant 1999 dollars)	322,269	183,975	506,244	34,123	34,123	30,512	30,512	28,672	32,249	32,767	33,827	33,987	33,794	31,158	31,180

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	36,613	37,602	38,915	39,668	99,596	0	0	0	0	0	0	0	0	0	0	0

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **2014**

Project **SR-SF01-LT / K Area Spent Nuclear Fuel Project (Post-2006)**

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (constant 1999 dollars)	29,073	29,074	29,298	29,079	67,451	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	36,613	37,602	38,915	39,668	99,596	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	29,073	29,074	29,298	29,079	67,451	0	0	0	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	3.60%	3.60%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project:

Current Projected End Date of Project: 9/30/2013

Explanation of Project Completion Date Difference (if applicable):

105 K will continue to be used for Pu, HEU and HW storage until dispositions have been determined.

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):

Actual 1997 Cost: 34,123 **Actual 1998 Cost:** 30,512

Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars): -64,635 **Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):** -1,745

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **2014**

Project **SR-SF01-LT / K Area Spent Nuclear Fuel Project (Post-2006)**

Project Reconciliation

Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	-66,380

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):	313,703	Added Pu Storage, extended HEU & HW storage, and extended expected facility life
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	247,323	
Additional Amount to Reconcile (+):	194,286	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**441,609**	

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Project Start	SR-SF01-001		10/1/1996								
Plutonium Receipt Readiness	SR-SF01-002		3/31/2000								Y
DNFSB 94-1 Materials Deinventory complete	SR-SF01-003		3/31/2001					Y			
Complete HEU transfer	SR-SF01-004		9/30/2004								
Project Complete	SR-SF01-005		9/30/2013								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Project Start	SR-SF01-001			Y							This date represents the beginning date for the planning document

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Savannah River**

Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site**

HQ ID: **2014**

Project **SR-SF01-LT / K Area Spent Nuclear Fuel Project (Post-2006)**

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
											currently being employed by the Department of Energy. The actual start date for the facility covered in this PBS is in the early 1950's.
Plutonium Receipt Readiness	SR-SF01-002										Complete Phase I and be prepared to commence Plutonium receipts from the Rocky Flats facility.
DNFSB 94-1 Materials Deinventory complete	SR-SF01-003										All DNFSB 94-1 materials will be deinventoried to SRS facilities.
Complete HEU transfer	SR-SF01-004										Highly Enriched Uranium is currently stored in 105-K and needs to be dispositioned to facilitate eventual facility deinventory and shutdown. The current plans are to send this material H-Canyon for blend down.
Project Complete	SR-SF01-005				Y						This project is complete and the facility has been turned over to the Facilities Decommissioning Division for deactivation and a final disposition determination.